JPRS L/10284

26 January 1982

Japan Report

(FOUO 5/82)

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000500020053-6

JPRS L/10284

26 January 1982

JAPAN REPORT

(FOUO 5/82)

CONTENTS

MILITARY

SOCIALIST, SCHOLAR, FORMER GENERAL DISCUSS DEFENSE ISSUES

Tokyo HOSEKI in Japanese Nov 81 pp 86-103

[Statements and debate by three experts--Masatsugu Ishibashi, socialist, Hiroharu Seki, University of Tokyo professor, international politics; Goro Takeda, former chairman of the Joint Chiefs of Staff, Self Defense Forces: Parts 1 & 2: "Defense Debate: Neutrality Without Armament?, Antinuclear Campaign?, or Deterrent Force?"]

[Text] Is Japan threatened by the Soviets or Americans, or is there another threat? A heated discussion by three contemporary participants on the strategy for defense or peace in the new nuclear age!

Part I. Statements by the Three Participants

Masatsugu Ishibashi: It is unrealistic for Japan to try to defend itself militarily against the U.S.-USSR nuclear strategy.

Last year I wrote a book entitled, "Neutrality Without Armament," and in it I repeatedly stated that there is no course toward an absolute security guarantee. It is strictly a relative matter. Concretely, the question is whether to rely on military power to defend national security or to use nonmilitary means, mainly diplomatic measures, such as to establish friendly relations with various countries, particularly neighboring countries, so as to create an environment which dissipates the distrust or anxiety about attacking or being attacked. Needless to say, I think that the latter course is preferable. The spirit and the stipulations of the present Constitution, which incorporates strong promises emanating from the experience of defeat in war, aptly points toward that course.

However, there are doubts that it is easy to maintain friendly relations with all countries. I, myself, have recently gained greatly increased confidence on this point, because there is proof of a positive achievement before our very eyes. That is none other than Japan-PRC relations. At present, the potential enemy is the USSR. Hardly a day goes by without the Soviet threat being mentioned. However, looking back to 10 years ago, what was the situation? Although the military might say that the PRC threat and not the Soviet threat was strongly emphasized.

When the U.S. Government changed, the Japanese Government changed and the Japanese people changed. Japan-PRC friendly relations materialized. Wasn't it possible? Even with the Soviets, wouldn't it be far better to establish relationships such as those with the PRC at present than to try to oppose them by increasing the military strength?

First of all, is it possible for Japan to think that it can defend itself by means of military power? As you are aware, Japan is a trading nation and depends on foreign countries for raw materials, energy sources and even foodstuffs. How can it be possible for such a country to think of conducting a war? Even without the experiences of World War II, it can be said that security of the maritime transportation route is absolutely impossible.

Is It Certain That the United States Will Come to Our Aid?

I have never heard the opinion that Japan can defend itself alone. Since Japan is an independent country, it is only natural that it should defend itself. This argument sounds fine. However, when you probe into the matter, you learn that you are not going to defend yourself alone. Those who advocate increased military strength inevitably insist on the necessity of the Japan-U.S. Security Treaty. In other words, they are saying that Japan is helpless alone and that Japan's national security must be guaranteed through strengthening Japan-U.S. relations. Therefore, the argument is not acceptable. This being the situation, Japan cannot complain even if a submarine hits and runs or cuts the net of a Japanese fishing boat.

Then, is Japan secure as long as it has the security treaty with the United States? The question has been raised as to whether the United States is certain to come to the rescue in the event Japan is attacked and invaded. I have no confidence at all on this point. I cannot entertain such easy-going expectations that the United States will hurry to Japan's aid if it expects its own homeland to be devastated.

Next, even if we should make great concessions and assume that the United States would rush to Japan's aid, there is still the question of whether Japan could hold out alone until then. National Defense Council Secretary-General Kaibara, who was once called the "emperor" when he was at the Defense Agency, wrote: "If the Soviets attack, the Air Self-Defense Forces [ASDF] will be wiped out in 10 minutes, while the Maritime Self-Defense Forces [MSDF] and the Ground Self-Defense Forces [GSDF] might be able to function as organized units for 2-3 days and 3-4 days, respectively." In this connection, when I interpolated him in the Diet, Kanemaru, the director-general of the Defense Agency, replied that "we can hold out for 1 or 2 weeks." Even if this is somewhat exaggerated, if they can hold out alone only for that limited period, will U.S. rescue arrive on time?

Let's make another big concession here. Let's assume that the rescue would arrive on time. If the United States and the USSR used the Japanese homeland as the battleground, what would be left? Only millions or tens of millions of casualties, or people starving and despondent, destruction, etc. What would really be protected? If the United States and the USSR should engage in warfare, it would become a nuclear war, and therefore a desperate situation such as that described above would have to be expected. In other words, a defense that is dependent on military strength is not realistic.

Another matter that should be kept in mind is that military power is always self-proliferating. Military men will never consent to the argument that more troops are unnecessary, that only a few troops are needed, that modern weapons are not needed, that this or that action is restricted, that you cannot possess

this, etc. Civilian control is casually mentioned, but the military will not accept the control that "this is the limit and nothing more is required."

If there is a restraint on the proliferation of military power, the most effective restraint is the economic or financial power of that country. This applies to Japan. If there were no Peace Constitution and if we did not have the power to insist that Article 9 be obeyed, Japan's military strength would not be limited to seventh (some say eighth) place in the world today. Since the GNP is third highest in the world, it can be said that the military power would be certain to be comparable, i.e., third largest in the world.

Mr Takeda, who will speak later, stated in a magazine (HOSEKI) that "Military power equivalent to 1 percent of the GNP is not useful but power equivalent to 3 percent would be effective." I think that that is a natural demand if you assume that military power is necessary. At the same time, if you take the position that military strength is required, it is only logical to think of establishing a conscription system, enacting secrets preservation and emergency laws, setting up a national mobilization system, placing controls on the economy and also on the transportation system. It is natural to have comprehensive planning. The reasoning that military power is needed but not a conscription system or a secrets preservation law is illogical.

Please think about it. Out of consideration for the constitution, Japan has a passive defense. Since he is a military man, Mr Takeda stated how difficult a strategy passive defense is and warned that if only passive defense has to be relied upon, the people must be prepared to expect a rain of bombs and be temporarily occupied. I do not have confidence in passive defense, but if that is the factual case, the battleground will always be Japan and I do not think we can relay upon the Self-Defense Forces [SIF] to fight alone. Whether or not there is a conscription system, unless there is determination of the national populace of 100 million persons to carry arms and fight, the strategy will fail.

In other words, although the military is necessary, civilian control is impossible if there are limitations as to your actions or there are constitutional restrictions, etc. It is true that the system itself might be considered flawless but I do not think that that alone makes control possible.

To mention another item, I think that if military strength continues to be self-proliferating, the course will lead directly to Japan's becoming a boundless, great military power and similarly, if the necessity of the security treaty is recognized, it is only natural that it will lead to a military alliance. Through Prime Minister Suzuki's visit to the United States, the word "alliance" was mentioned for the first time in a joint communique, and I think that this is only natural. The line of reasoning will not hold forever that the security treaty is necessary and Japan wants aid in case of emergency but that it will not concern itself with any warfare that the United States conducts elsewhere. While the United States was overwhelmingly strong militarily and could boast of its national strength, the situation could be overlooked. However, at present, when the United States has lost its superiority, it is desperate to regain it through combined power with an allied country. The United States is not willing to let Japan have its own way and is proposing that the treaty be made one of mutual responsibility. Japan has so agreed, and this situation is reflected in the new "alliance" which is

actually progressing rapidly. Also, preparations are being made to alter the constitution, if possible, to officially recognize the right of collective defense.

Then, without a constitutional revision, is it impossible to dispatch troops overseas? That is entirely false. Even in this respect, developments are rapidly advancing. Last year's RIMPAC--a joint maneuver of countries rimming the Pacific Ocean--is a concrete example. Another fact which must be mentioned at this time is the fact this is the nuclear age. It is said that with the United States and the USSR as the central powers, atomic bombs equivalent to over 1 million of the bombs dropped on Hiroshima and Nagasaki are now available. Strangely, people who claim that "there is such a possibility as an unlikely emergency and one can never tell which country might attack," do not have any doubts that there is the possibility that over 1 million atomic bombs might be used and that mankind might be wiped out.

Efforts for Total Arms Reduction and Disarmament

I personally think that if the chances are 10,000-to-1 that a country with which Japan tries earnestly to become friendly would stage an unreasonable attack, then the chances of a nation being destroyed by atomic bombs are 1,000-to-1 or 100-to-1. Recently, there has been a lot of talk about the neutron bomb. This is a weapon which links up conventional weapons with the so-called hydrogen bomb, thus making it easier to use the hydrogen bomb. You are aware that Western countries in which they are to be placed have become sensitive and are opposing the action.

When one considers all these factors, it must be said to be wishful thinking if one believes that by acknowledging military power centered on hydrogen bombs, one is assuring not only the national security of Japan but the continued existence of mankind. No matter how difficult it is, there should be complete arms reduction internationally and disarmament domestically. I firmly believe that we cannot abandon our efforts toward the realization of this end.

However, this does not mean that if the JSP should take over the reins of government, there would instantly be neutrality without armament. A conservative party has run the government for a long time and created unfortunate conditions, such as adopting hostile policies toward the USSR, withholding diplomatic relations with the DPRK up to now, etc. In the event that we take over the realities of such existing international relations and abolish the SDF immediately. The initial action we should take is, as I said at the beginning, to improve Japan-Soviet relations to the level of the present Japan-PRC relations. This is the priority item. Even with the Japan-U.S. Security Treaty, it is not simply a matter of unilaterally nullifying the treaty on the basis of Article 10. We want to cut off military relationships, but friendly relations with the United States should continue to be carefully nurtured. In other words, I want to make it clear here that we intend to utilize diplomatic means, as well, in carrying out our plans.

With the Increase in the Risk of Limited Nuclear Warfare Faced Today, the National Security Policy of the Past Is Not Applicable

Hiroharu Seki: I want to focus my remarks on the issue of the realities of nuclear weapons and the national security of Japan, and point out that at present, Japan together with Europe is being placed in an extremely dangerous position.

The basis of the classic pattern of national security policy of the past has noticeably weakened, and because of that, advocates of the so-called "hawk" faction have appeared in great numbers. The classic national security policy of Japan was to rely on the U.S. nuclear umbrella and to try to get by with small-scale military strength. This is the type of thinking typical of Inoki Masamichi, but now the basis for such thinking has become dubious. Speaking frankly, this means that Japan has come to the crossroads regarding whether to possess nuclear armament or to switch completely to the diplomacy of peace.

Within Japanese political circles, although in small numbers, forces have begun to infiltrate which think that the "three" non-nuclear principles should be changed to "two and a half" to permit limited entry of nuclear arms, or who advocate "two" non-nuclear principles so that nuclear weapons can be emplaced within Japan. I think that is a very dangerous development. I think that it is necessary to consider why such a situation has occurred.

I believe that Mr Inoki, who has been called a "dove" within the "hawk" faction, is being severely criticized because very recently the classic national theory has become extremely unrealistic. In that sense, there is some truth to the arguments of those who advocate nuclear armament for Japan. However, what is the truth? At this point, I would like to analyze this point in detail.

As you are aware, Japan was defeated in the Pacific War. Japan's final defeat was brought about by the atomic bomb disasters of Hiroshima and Nagasaki. The destructive power of the atomic bombs at that time was approximately 13 kilotons. However, by that single blast, 80,000 persons died instantly, and eventually a total of 200,000 persons suffered death. What would happen if the powerful nuclear weapons of today, e.g., a 1-megaton-class bomb, should be dropped on Japan with its dense population. According to my calculation, with about eight bombs, nearly 30 million persons would die. In World War II, Japan surrendered after suffering 3 million casualities. Would it have been possible to start a war if it had been known that the risk was the death of 3 million persons? That national security can be guaranteed is doubtful. Rather, it can only be said that the best course is to abolish war.

The present national security policy is fundamentally mistaken. It seems that the Defense Agency is planning a strategy based on the assumption that such a nuclear attack will never be made on Japan. If strategy is based on the condition that nuclear attack is possible, the director-general of the Defense Agency cannot be thinking of such easygoing strategy.

The Dangerous Race for Emplacement of Nuclear Theater Weapons

Looking at the overall situation today, I think that the risk of nuclear war has increased tremendously. The reasons are that the accuracy of nuclear weapons has improved and nuclear theater weapons [NTW] have appeared. A race has begun for emplacement of NTW's between NATO countries and Soviet-controlled countries. Against the Soviet SS-20 and Backfire aircraft, NATO has decided to position over 100 Pershing-2's, which possess the same destructive power as the Hiroshima-type bomb, in five Western European countries, along with 460 cruise missiles. The cruise missiles are of the 200-kiloton class, so they have over 10 times the strength of the Hiroshima-type bomb.

If these weapons are emplaced and their accuracy is good, what does it signify? Europeans are beginning to think seriously about this matter. Japan, which experienced the disasters of Hiroshima and Nagasaki, conceived the progressive idea of "neutrality without armament" which Mr Ishibashi advocates. However, that is an idea that is difficult to sell to peoples of the world. The various countries of the world have not tried to imitate Japan and attain neutrality without armament. Therefore, the Japanese Government claims that it is foolish for Japan alone to make such a statement, that it is unrealistic, and therefore, Japan should follow the rest of the world. To follow the world means to adopt the logic of guaranteeing national security by increasing military strength. The Japanese Government is suggesting that Japan do likewise. The United States is putting strong pressure on Japan, but because Japan is following such reasoning, it cannot help but receive such U.S. pressure.

However, the world situation today is completely the reverse of that of yesterday. Europe has begun seriously to learn from the atomic disasters of Hiroshima and Nagasaki. In Europe, for the first time in history, antinuclear opposition movements have begun to increase. The reason is that they have begun to feel personally the seriousness of the risk of becoming the battleground of a limited nuclear war.

The agitation started in northern Europe and spread via Netherlands and Belgium to West Germany. There was a rally of 100,000 persons in Hamburg, West Germany. Will only the Germans be annihilated by a nuclear war or will they survive? Are nuclear weapons to be positioned even at the risk that only West Germany will be destroyed? Confronted with these sober questions, Chancellor Schmidt was placed in a dilemma.

That is to say, in the age of limited nuclear war, only those places where nuclear weapons are placed will be attacked. The present U.S.-Soviet strategy is steadily moving in that direction. The U.S.-Soviet Nuclear Nonproliferation Treaty was concluded in 1973 and it was at that time that both parties first realized, to a certain extent, that both countries would be destroyed if all-out nuclear attacks were launched against each other. The concept then developed that the United States and the USSR alone should be made sanctuaries. The position was then taken that nuclear theater weapons could be built, and as confidence in their accuracy developed, the United States and the USSR could mutually oppose each other strategically in a limited nuclear war, using other countries as the battlegrounds for nuclear war. The United States took the lead in adopting this strategy.

That action would still have been tolerable if it had been the detente period when international tension was eased. Changes in military capabilities would not necessarily have led to the start of a limited nuclear war. However, since 1979, international politics have retrogressed. The situation is the same as the period when the cold war started. Without regard to the impression he might create, President Reagan began to increase nuclear strength. As you know, President Reagan's administration has again started nuclear arms expansion and is clearly stating that it would be victorious in nuclear warfare. By victory, it is talking of a limited nuclear war. We can no longer rely on the United States because it has become extremely dangerous.

If Japan were to introduce nuclear weapons, it would assume the same risk or even a greater risk than Europe of becoming a battleground. Non-nuclear and antinuclear

movements have increased in Europe. How about Japan? As is well known, the JSP, which would become the leader, had the record of first advocating a non-nuclear stance and because of its influence the "three" non-nuclear principles were passed by the Diet. In spite of such a past glorious achievement, the JSP is floundering at this most crucial time. Even with Mr Ishibashi beside me, I can boldly say that I cannot stand watching the JSP. Now is the time for the JSP to spread its network worldwide and work for peace....

As a whole, the Japanese people are not alert to the changes taking place in the world situation. Within the faction that advocates the strengthening of military power, some echo the national security policy drawn up by the U.S. Pentagon and have increased their attack on people who favor the policy of peace through diplomacy. As part of the attack, those who advocate the classic national security theory mentioned at the beginning, i.e., the "doves" within the "hawk" faction which believes in relying on the U.S. nuclear umbrella and in maintaining a small regular military power, are being isolated and coming under criticism.

Create a New National Security Policy

Then, how should we think in these dangerous circumstances? First of all, the Japanese people must completely discard the Pentagon-made national security theory and create a new policy based on Japan's historical traditions. The Japanese should have that much intelligence.

Japan has become a powerful economic nation and, except for military science and technology, is the world leader in the S&T field. Utilizing this S&T knowledge and economic power, Japan has the capability to bring peace to the world. Unfortunately, that capability is not being used toward the right goal. This capability must be diverted, somehow, toward a new direction, and I want the JSP to strive to assist. The time has arrived for the SDF and the JSP to work together. If those in the SDF truly think of their country, I do not think that they will join hands with those in the "hawk" faction who talk of military threats. It is not strange for them to join hands with the JSP. I think that now is the time when the Japanese populace should rise above political parties and work for peace through diplomacy. The time has come when it is necessary to unite with the "dove" faction of the Liberal Democratic Party and think carefully about what type and how much of an effort is needed for negotiations for arms reduction.

The activity of the Palme Committee is an example of the type of arms reduction efforts about which we are thinking. Mr Palme, who was formerly the prime minister of Sweden, has created a secretariat in Vienna, in neutral Austria. That office is working on a new arms reduction plan in preparation for next year's UN arms reduction special assembly. There is a movement afoot now in Japan to have a member of the [Palme] committee hear the statements of Hiroshima victims, to have the commmittee sponsor a roundtable discussion in Hiroshima with citizens regarding nuclear problems and to have the comments included in the proposal by the Palme Committee. Hiroshima city, United Nations University and Hiroshima University are jointly working on this plan. These movements must take place everywhere.

Various ideas are needed to establish a new pace and simply to halt the movement toward military expansion. How can such ideas be cultivated? Such concepts must be researched mainly at universities. To do that, a peace department is needed.

There is none yet in Japan, but in the UK there is a Peace Department at Bradford University. In Japan, education toward peace is conducted by a limited number of teachers on the elementary, middle and high school levels. However, education toward peace is hardly carried out at all in universities. There is an urgent need to consider what is best for establishing an education toward peace in universities. At the next stage, there should be a citizens' college--i.e., it is necessary for us citizens to voluntarily establish a new university. Under those circumstances it would become possible to establish a meaningful, new education toward peace. Ultimately, peace is something that has to be created.

Peace Will Not Come Through Prayer Alone; SDF and Japan-U.S. Security Treaty Are Deterrent Forces

Goro Takeda: To create a world which will abolish war and which will not resort to force to solve international conflicts is the hope of mankind, as the two previous speakers stated. This is not a new development but the ideal and prayer of mankind from the past. In any country in the world, there are probably no people who say that they like war. In Japan, there is the Peace Constitution, and efforts are being made to preserve peace. I think people in general believe that "we should depend on the justice and faith of those who love peace to protect our security and existence" and that "no country must think only of itself and ignore other countries."

However, even if the wish for peace is important, I do not think that the real world is that idealistic. During the 36 years since World War II, 72 big or small wars have occurred. Even now, conflicts are raging constantly in the Middle East, Southeast Asia and Africa. At present many people in the various EC countries reportedly are fearful of a third world war. Everyone loves peace but wars still continue. This is a fact. I think it might be said to be the "inevitable deed" of mankind.

There are over 160 countries in the world today, but each has its own sense of value which differs from others, and all countries pursue their own national interests. Even if utmost efforts are expended on attaining peace through diplomacy, sad to say, in the pursuit of national interests, conflicts arise between countries. History shows that even in the midst of cooperation, confrontations have taken place. If there is for certain a sure way of preventing such confrontations--and of course, we must try ourselves to conceive such a method--we will naturally abide by such means. However, there is no brain trust which can immediately think up such a good method, and sad to say, the reality is that cooperation and confrontations have continued.

Confrontations have been the cause of conflicts, and conflicts have developed into wars. In the pursuit of national interests, there is the temptation of aggression if the gains seem large compared with the efforts expended. Therefore, countries in the world place priority on building up their defensive power to protect themselves and to prevent aggression. Japan is now thinking of national security in terms of overall national security policies, including nonmilitary means, but if there should be an unfortunate invasion, military power would be the decisive factor.

Deterrent Force Capable of Countering Aggression

Both previous speakers stated that it is important to halt aggression, but even if efforts are made to stop invasions from occurring, world history proves that aggression can occur. It is necessary to possess the power to counter such an invasion, if it should occur. The strength to counter aggression serves as a deterrent force. I think that emphasis should be placed on that point in our thinking.

Now, in surveying Japan's surroundings, the neighboring countries are the USSR, the ROK, Taiwan and the PRC. Among them, I think that the country posing the biggest threat and making us feel uneasy is still the USSR. Why is that? First of all, the sense of value is different. In advocating communism, it extols the communization of the world and continues to follow expansionist policies. Since World War II, the USSR has acquired a huge territory of 500,000 square kilometers, and Japan has the bitter experience of having the Kuriles Islands occupied. The recent increase in military strength is shocking. During the past 20 years, defense expenditures have amounted to 11-13 percent of the GNP. According to one reference, it has reached 14 percent. Not only nuclear weapons but the ground, naval and air forces have been greatly strengthened, and from the standpoint of quality and utility, the forces have changed from the defensive to the offensive type.

If military power increases to such an extent, it can be said that the Soviets now possess the power to act simultaneously at several places in the world. Using detente as a mask, the USSR is advancing to various parts of the world, supported by this enormous military force. As you are aware, the Soviet strength has gradually infiltrated into the vacuum areas created by the withdrawal of weakened Western forces, such as the United States, Europe, etc. Starting with Angola in 1975, there are a number of cases such as Ethiopia, Yemen, Afghanistan, etc.

Let us consider the Far East situation, and in particular, Soviet strength in the Far East. Regarding nuclear weapons, the Soviets have placed one-third of all the weapons they possess there. In 10 years, the army has doubled its previous strength. In the past 3 years the navy has added 270,000 tons. Since the total strength of the Japanese MSDF is 200,000 tons, one can realize what the figure of 270,000 tons means. The air force has 2,200 aircraft, of which over 800 are attack aircraft. It is a fact that the Backfire supersonic heavy bomber has already been stationed in the Far East. As the Soviet Far East force increases its strength, it is only natural that its activities become more intense in the vicinity of Japan. At present, the number of warships which pass through the Soya, Tsugaru and Tsushima straits number no less than 400. The number of large aircraft which approach Japan proper is 200. There have been incidents in which aircraft armed with AS-6 missiles, with a range of over 200 km, approached to within several tens of kilometers of the Noto Peninsula in broad daylight and approached to within 100 km of the coast of Shakotan, Hokkaido. Hereafter, if MiG-23's and SU-24's are stationed in the Kuriles, all of Japan will come within the attack range of these aircraft.

If the Soviet Far East forces are strengthened to such an extent, what should be done to protect Japan? It is questionable whether Japan can really be defended. As mentioned earlier in this discussion, Mr Kaibara has stated simply that Japan

would be crushed. True, that might happen if, in the present situation, war should start tomorrow. The basis of my thinking is that efforts should be made to avoid just such a situation. Basically there is no policy without faults, as Mr Ishibashi pointed out earlier. I think that out of a number of proposals, the one with the most advantages and the least defects should be adopted as Japan's policy. This applies to defense policy: the one with the least disadvantages should be selected, and the government should strive to decrease these disadvantages as much as possible. Simultaneously, the government should recognize as risks the defects that remain, and I think that it is important that the people be thoroughly informed.

The Four Pillars Which Protect a Country

What measures are available to protect Japan? I think that there are only the following four measures. If there are other better ideas, I would like to be informed, from Mr Seki, too. The four are: 1) neutrality without armament; 2) armed neutrality; 3) join the Soviet camp; and 4) defend the country with the SDF and the Japan-U.S. Security Treaty. The best measure should be chosen from among these. First, regarding neutrality without armament, I read what Mr Ishibashi wrote and there were many points with which I could agree. However, after reading it through, I could not help but experience the following doubts: If it is such a good method, some country in the past or some country now should be depending on neutrality without armament to protect the country's security and making progress. Regrettably, no such case exists. No matter how intelligent and outstanding a race the Japanese are, it is a bold adventure and a test to try a method never used by any country or without any precedent. I cannot approve it. The Japanese people are not necessarily in favor of neutrality without armament. According to a survey made only 3 years ago, only 6 percent were in favor of this. Data also appeared showing that some in the JSP also had doubts about the theory of neutrality without armament.

Next, let's consider armed neutrality. Since this will lead to the conscription system and nuclear armament, and since defense expenditures might reach staggering amounts, it cannot be adopted. Join the Soviet camp. This measure is not acceptable to the Japanese people.

Then, although there are many flaws as well as doubts, the only means left for the present is reliance on the SDF and the Japan-U.S. Security Treaty. I think that this policy has the greatest deterrent effect and that the reliability of the deterrence is the highest. As I have said repeatedly, everyone has the same feeling of hatred of war. However, peace will not come simply through prayer. While squarely facing reality, we must think of policies which will not create war, but will deter war, and in the event of aggression, measures that will repel it and preserve our independence. In that sense, I think that to protect our country now, the following four pillars must be firmly implanted. The first is the minimum necessary defensive power. The second is a reliable Japan-U.S. security setup. The third is the preparation of the domestic organization. There might be problems involved, but if the fighting is to take place in the homeland or within the vicinity of Japan with the homeland as the base, preparations of a proper domestic order are necessary. I would like to see a draft prepared on this item and thoroughly debated in the Diet. As for the fourth point, and this is the most important, it is the will of the people to defend Japan by themselves. Since those

we are going to fight are our enemy, there is no one else except the Japanese, in actuality, to stand in the way of the invaders.

When I make these statements, there might be those who think that the minimum necessary defensive power might become one of preposterous proportion and that Japan would become a great military nation.

A while ago, what I wrote in the periodical HOSEKI (March issue) was misinterpreted, and there were some who thought that I suggested that a defense expenditure of 3 percent of the GNP was necessary and that 1 percent was meaningless. Actually, that is not what I really meant. If one read the entire text of my statement in HOSEKI magazine, the misunderstanding should be corrected. What I wanted to say was that to defend Japan, locking up the doors was necessary just as we protect our homes. If burglars should enter the neighboring villages or towns and commit arson, naturally the local government councils, vigilante groups or police would conduct night rounds and increase the number of streeet lights. In that sense, i.e., to associate equally, we must contribute an appropriate share. The United States and European countries are contributing from 3 to 5 percent, in spite of their difficulties, and from the standpoint of "equal association," I mentioned earlier that 3 percent might be proper and that 1 percent might be too little. I do not think even now that 3 percent is necessary. To me, the main problem is always the most important.

The foregoing is my thinking regarding defense and to summarize, I think the foremost problem is to prevent war. Of course, for that purpose, we must exert all-out efforts for peace through diplomacy and try other means. However, in spite of that, emergencies arise. I think we should prepare the minimum power to counter such emergencies and that power will contribute to the deterrent effect. I do not think that will become such a burden that the people cannot bear it nor will it become a threat to foreign countries.

Part II. Defense Debate

Japan Cannot Be Defended With Your Strategy

Takeda: I wish to ask a question of Mr Seki. Abolition of nuclear armament must certainly be carried out, and it is a fact that in democratic countries, since there is freedom of speech, the outcry for nuclear elimination is getting stronger. Is the previously mentioned Palme Committee even thinking of staging a demonstration in the Moscow square? I think that to advocate it only in democratic countries is a simple matter.

Seki: In fact, the Palme Committee recently held a meeting in Moscow. When it holds the next meeting in Japan, it will have a representative from Moscow. For the United States, former Secretary of State Vance is also a member. That is to say, both the United States and the USSR are represented on the Palme Committee. Because of such members, the items discussed can be upgraded to policy level. Therefore, rather than demonstrations, the formulation of definitive policies is the most important function.

It is a fact that when it comes to freedom of speech, it does not exist in the communist sphere. However, even countries which we have chosen as allies, such as

the ROK and the Philippines, cannot boast of such freedom. Essentially, to protect freedom of speech, there are many political conditions which are required. To make the communist sphere free, international exchange is needed rather than a race for military expansion.

I would like to turn to Mr Takeda. Although you said that there is no country in the world with neutraility without armament, actually there is such a country. Costa Rica is one. You might say that it is a very small country but it has even established a Peace University.

Ishibashi: I would like to have a correction made, first of all. Mr Takeda said that the people supporting neutrality without armament was only 6 percent, but I would like for him to read a recent newspaper. The ASAHI SHIMBUN, which conducted the survey, discovered that those supporting neutrality without armament had been only 6 percent but that the rate had since increased to 30 percent, and was surprised and came to us for comment. I should like to ask that the newest figures not be ignored purposely.

Also, he said that there is no one who likes war, but I do not think you can say that. True intentions and official stances must be differentiated, and although it says that no one likes war, isn't the current Japanese political powers and government creating a trend which favors a prowar atmosphere? This year's "Defense White Paper" will be decided upon at the cabinet meeting day after tomorrow, but in it, an increase in defense awareness and patriotism have begun to be stressed strongly. The social climate from which we suffered before and during the war is again beginning to overwhelm us. What I really wanted to question Mr Takeda about is how he views the 15 years of war, i.e., the Pacific War. Does he think it was inevitable, after all, for the sake of Japan's security and defense?

What To Do if There Is an Invasion

Takeda: I know that, as Mr Seki stated, there are about 12 countries now that try to protect their countries through neutrality without armament. For example, there are countries such as Costa Rica, Monaco and Liechtenstein, but these are considerably different from Japan. Their positions in the world, geographical factors, etc, differ, and I do not think Japan can be compared in the same light.

Next, I agree with Mr Ishibashi that neutrality without armament is still an idealistic idea. In reality, what would we do in case of aggression? Naturally, we should try to prevent it. Everyone wishes this. However, if it should happen, what should we do?

Ishibashi: Please answer my question first. How do you view the 15 years of war, the Pacific War?

Takeda: At times, war cannot be prevented, even if one wants to do so. However, there might still be the accusation that in the name of "defense," actions lead to "aggression." It is true that the Great East Asia War could be interpreted in that way. However, I consider that there is something inexplicable about wars. I think we must consider the public opinion of that time, the development of events in past wars and the result of being forced into it. As compared with the Sino-Japanese and Russo-Japanese wars, however, I think that the last war appeared to be much more aggressive on our part.

Oshibashi: I think that only by frankly admitting that it was an aggressive war can one begin to reflect and adopt the proper attitude. Since you unexpectedly admitted that there was the appearance to some extent of aggressive warfare, I will say no more.

You ask what we should do in case an invasion takes place, but as I have said repeatedly, I cannot imagine at all that there will be aggression if Japan makes the utmost efforts to establish friendly relations.

If there is to be aggression against Japan, the only reasons would be the formation of a military alliance with the United States, sanction of U.S. military bases and the creation of a prowar atmosphere by assuming that the USSR is a potential enemy and clamoring daily about the Soviet threat. If these problems are resolved, I cannot imagine that Japan would be attacked.

Specifically, I am most worried about the talk about the three straits that came up earlier. There is much discussion going on about closing the Tsugaru, Soya and Tsushima straits, but if that is done in compliance with a U.S. request, what would happen? I think that we would be faced with a great crisis. That is because the Soviet Navy would be like a "mouse in a trap."

We must become worried only if we commit such actions, and if we do not, there will be no aggression.

Furthermore, I would like to ask specific questions. According to the intentions and official stances of the security treaty, "the United States will come to our aid if Japan is attacked. However, Japan will not participate if the United States should be engaged in war elsewhere. Through the mechanism of prior consultation, the entry of nuclear arms can be prevented. In case there is prior consultation on starting warfare, Japan will say 'no.'" Would such selfishness be tolerated?

While stating that Japan cannot be defended unless Japan and the United States conduct joint warfare, it is claimed that the unified command cannot be implemented because it is unconstitutional. However, men in uniform say after their retirement that Japan will not be able to defend, nor conduct joint maneuvers without considering the constitutional issue. Which do you think is correct? I would like to know which are the real intentions and which are only official stances.

Takeda: Before that, I would like an answer to my question on what we should do in case of an invasion. Although you stated that it would not occur....

Ishibashi: It will never occur. If we eliminate the causes that I mentioned.

Takeda: Although Mr Ishibashi says so, he has visited various foreign countries and talked with many VIP's but I believe that none of them agreed with the theory of neutrality without armament....

Ishibashi: Then, has Japan ever been invaded?

Takeda: I am talking about the future.

Ishibashi: No, there has been no case in which all of Japan has been invaded.

Takeda: There has been no such case in the past. I think that because of the Japan-U.S. Security Treaty setup and the SDF, no such aggression has taken place.

Ishibashi: I am talking about what has happened since the Sino-Japanese war. Since the Sino-Japanese war, the Russo-Japanese war, World War I, the dispatch of troops to Siberia, the 15-year war and the Pacific War...has there ever been an occasion when Japan was invaded? In all the wars, Japan was the aggressor.

Takeda: Events are decided by power relationships existing at the time, and Japan had military forces then. If events had transpired without the Sino-Japanese or Russo-Japanese wars, I think that Japan would naturally have been invaded. I think that we took action first.

Ishibashi: It is useless to talk about "if" in history. What is important is the facts.

Seki: I want to bring up a point here. The question has been raised as to what Japan would do if it was invaded, but has any thought been given to the event of Japan becoming involved in a limited nuclear war?

Takeda: I think that Japan would be annihilated if there were nuclear warfare.

Seki: Then, I would like to ask why you don't discuss such possibilities, and only take up cases of invasion without nuclear involvement.

Takeda: Just because you possess nuclear armament doesn't mean that it would lead immediately to nuclear war. Conventional warfare would take place first, and then it would escalate.

Seki: I am saying that you are behind the times. At present nuclear theater weapons are being emplaced, and hasn't the threat of limited nuclear war increased with the Reagan administration? Furthermore, isn't he saying let's have a nuclear war. It is strange that you are not aware of this. You have no qualifications as a former responsible official of the Defense Agency and you should have resigned. You are not thinking seriously of Japan's national security. We cannot entrust Japan to people like you.

Takeda: I do not think so. Conventional military strength is needed so that nuclear weapons need not be used. Because there is a great possibility of conventional warfare escalating to nuclear war, we should have the capability to cope with conventional warfare.

Views on the Introduction of Theater Nuclear Weapons

Seki: That is a basic mistake. Conventional and nuclear warfares are interrelated. Because of the close ties, if the introduction of nuclear weapons is gradually permitted, eventually a nuclear war will envelop everyone. Furthermore, at present, because of the introduction of theater nuclear weapons, the danger of nuclear warfare has never been so great. I would like to ask what your views regarding the introduction of theater nuclear weapons are.

Takeda: With regard to nuclear weapons, the countries which possess them know best their fearfulness, and they want to use them, first of all, as political tools and only God knows what will happen. I believe that they do not truly want to use nuclear weapons. There is nothing absolute about defense policies and as I have said from the beginning, the important factor is what measures should be taken to prevent nuclear war. The final measure, I think, is the abolition of nuclear armament.

Seki: If nothing is absolute, you should consider that Japan has not been invaded hypothetically. Isn't that the same?

Takeda: No, I don't think so. The past history proves that.

Seki: Since Japan has never been invaded in the past, isn't it all right to think of it as a theoretical question? Then, why do you only bring up the instance of a possible invasion of Japan and not consider the possibility of a nuclear attack? A nuclear attack against Japan would occur because of the Japan-U.S. Security Treaty and because Japan is part of the U.S. nuclear strategy system. Japan could become involved in a limited nuclear war.

Unless you consider such problems, I think that you are a complete failure as a responsible official of the Defense Agency. You do not have the capability to bear the responsibility for Japan's national security. You are a complete failure. I want to become the director-general of the Defense Agency. I am so inclined.

Takeda: Then, if you were the director-general of the Defense Agency, what measures would you take?

Seki: I would clearly proclaim Japan's diplomacy for peace and open up a new path. I would adopt an entirely new course.

Takeda: Speaking concretely, what steps would you take?

Seki: First, I would tie up with the "dove" factions of northern Europe and other European countries. It is necessary for Japan to open up foreign diplomacy by following a diplomatic course which is close to that of northern Europe. That should be the very first step.

At the UN arms reduction special assembly, a plan should be drawn up that would make possible an across-the-board arms reduction. On that subject, an exhaustive symposium should be held with U.S. political scholars. Before the UN special assembly is held, with the UN University as the center, the sons of all the world's politicians should be made to live in Japan as hostages. Then neither the USSR, the United States or any other country could attack Japan. The funds for such a purpose must be created. Then, a peace department should be established in all Japanese universities. The contents of the Civil Service examinations must be completely changed, and more "peace warriors" must be nurtured in Japan. The SDF would be totally switched to that program.

As for the UN peace maintenance forces, unlike the JSP, I am willing to send some Japanese troops. However, in order to do that, Japan must become neutral and pursue a peaceful policy. It is a fundamental error to dispatch the SDF to the UN peace

maintenance forces under the present Japan-U.S. Security Treaty. This is not neutrality. To remain neutral in such conflicts is the least we can do, but at present there is practically no case where neutrality can be maintained in such conflicts. As a rule, unless we become neutral, we cannot transfer our SDR to the UN peace maintenance forces.

Takeda: From what you have just said, I agree heartily that a UN university should be established and foreigners should be invited to Japan. However, I do not think that such actions would make defense capability unnecessary.

Groping for World Arms Reduction

Seki: Haven't you ever thought of gradually decreasing defensive power and eventually bring about nonarmament or arms reduction?

Takeda: That is because reality is not so.

Seki: Then, why don't you work toward it?

Takeda: Naturally, I'm making the effort.

Seki: You have never tried it. The SDF has done nothing about it. It is proceeding in the reverse direction. You are advocating that it go in the opposite direction.

Takeda: That is not the function of the SDF; its duty is to increase the power that it possesses. Such general plans must be considered elsewhere.

Seki: That is why we should not head toward military expansion. At least, we should stop.

Takeda: I do not think so.

Ishibashi: I want to return to the previous question. As a policy, "when we fight together with the United States, a unified command is not possible because of the constitution." Those in uniform are asking how we can fight under such circumstances? I think that it is proper as a military theory. Mr Takeda, which course are you choosing? Are you saying that the constitution should be ignored and that since victory takes precedence, a unified command is absolutely necessary, as the men in uniform say? I think that is the proper argument for the military men. However, if you are determined to defend the constitution, then you should defend it completely, as we are saying.

As for the 1 percent or 3 percent question, while you were saying earlier that 3 percent was necessary, you are now becoming vague about it. If I were a military man, I would think it only natural to advocate the 3 percent.

Takeda: I do not think so.

Ishibashi: Then, you were saying 3 percent was necessary just to be sociable?

Takeda: I already spoke my piece earlier.

Ishibashi: All NATO countries are expending from 3 to 5 percent of their GNP. If you are going to keep company, the United States and the EC are saying to pay out as much as other countries. Only Japan is making the excuse that "No, 1 percent is enough," and not keeping up with the other countries. I think that the military men's argument should be: "Please pay as much as the other countries. Please assist us financially, as we shall try our best militarily." However, because of the constitutional problems their true intentions might be that, but they can only make sociable arguments. I think that this is not right for military men. What are you going to do with such halfway military power? If you are going to defend a country with military power, then let us strive for completeness in armament, strategy and other aspects. This is the proper attitude of the military. I insist on an answer to this matter.

In connection with this subject, there is a question I would like to ask of you military men. I do not say that all are involved, but when the higher ranking officers resign, they enter the armament industries. The arms industries and high-ranking officers seem to have a strange relationship of interests. What do you think of this setup?

Is Military Power Self-Proliferating?

Takeda: First, I want to express my views regarding the constitution. I want it understood that I am speaking as an individual and not as the former chairman of the Joint Chiefs of Staff.

As far as the constitution is concerned--and probably all laws are the same--but even if there is a defective law, as long as it is recognized as the law, I think that it must be obeyed. I hope this viewpoint will not invite further misunderstanding.

However, laws are made by men and as the world changes, various distortions take place. Therefore, a lot of research and discussion are needed on defects in the law in their problem areas. It was pointed out that there are a number of problems concerning the constitution. There should be further discussions, and based on the talks, the people should be asked whether it should be changed. I am sure that there are certain problems connected with it. However, I believe that as long as the law is in effect, it must be obeyed. In essence, the constitution exists for the safety and development of the country.

Next, there was mention of professional military men accepting other jobs in the private sector after retirement, and that is a fact. I believe there is a considerable number of such men. However, they are not all in operations divisions. They are not in special positions where they are asked to divulge intelligence information or to speak on military affairs. The truth is that they are treated as casual consultants.

Ishibashi: Military power is self-propagating. Once military strength is accepted, a country gradually becomes a great military power. Especially, military men's logic works in that way. I do not want to mention his name but I talked to another chairman of the Joint Chiefs of Staff and he revealed his true intentions by saying: "We should have our own nuclear armament." I believe that military theory will lead to that conclusion. On the basis of such thinking, the possibility becomes strong

of following the erroneous path of militarism. For the moment, with our political power and party responsibilities, we must put a brake on those who try to build up a big military nation through self-propagation.

I want to conclude by saying that the most effective restraint is to say repeatedly that we should protect our constitution and not be so boastful; after all, it's our constitution and we should try our best to comply with it. That is our only restraint.

Seki: It has been learned recently, as a result of scientific research, that the national security theory of the present military experts, including the Defense Agency, has been completely mistaken. I want to mention the most concrete example. The United States has made an effort toward military expansion to defend its own country. However, the end result is that in the past 36 years since the end of World War II, the safety of the United States has never been in such a dangerous position vis-a-vis the USSR. In other words, as a result of an increase in military power, national security has fallen into a crisis. The cause is not the Soviet threat.

Furthermore, according to various studies, when great powers confront each other with military power, in 70 percent of the cases war has resulted, according to history. The casualties amount to 70 percent--that is a terrible disease. The fact is that the military expansionists theory has been proven fundamentally wrong.

Thus, what is necessary for Japan is to resist the demands for an increase in military strength by the Reagan administration. We should give all our consideration....

Takeda: Self-proliferation of military power--possibly, history will verify such tendencies. Particularly in Japan's case, such a tendency appeared in World War II, but the military organization is not the same today. At that time, the military had an independent command authority and could act alone, but at present I think there can be civilian control. In the future, I believe that if we reflect upon the past and make an effort, the good conscience of the Japanese will be able to solve the problem.

9134
CSO: 4105/15

SCIENCE AND TECHNOLOGY

DEVELOPMENT OF INDEPENDENT SPACE INDUSTRY SAID DIFFICULT

Tokyo TOKI NO KEIZAI in Japanese No 302 Nov 81 pp 33-35

[Excerpt] It is true that with the success of the space shuttle, space industry has achieved reality, but in what ways will it develop hereafter?

There is a report concerning this ("A vision of space industry") prepared in April of this year by the Round Table Conference on the Fundamental Problems of the Space Industry, which is a personal advisory organ of the head of the Machinery Information Industries Bureau of MITI. This is the first time the Japanese space industry has been treated systematically as an independent industry.

A One-Trillion-Yen Market in the 90's

According to this report, the space industry is "a powerfully creative, knowledge-intensive industry, and it is expected that there will be a resulting broad spin-off of technology." Emphasizing its spirit of growth, the report forecasts that the space industry in Japan will in the 5-year period of 1981-85 reach a level of about 1.1 trillion yen, and in the 5-year period of 1986-90 about 2.1 trillion yen. Its also predicts that annual production, presently at a level of 100 billion yen, will in 10 years reach 500 million yen; by the middle of the 1990's it will be on a scale of 1 trillion yen. Incidentally, this report estimates that the size of the world market for the period 1986-90, taking all 5 years together, will be 36 billion dollars (about 7.6 trillion yen). It is estimated that Japan will obtain a strong one-fourth share of it during this period. Exports for the 5-year period 1986-90 are seen at about 650 billion yen.

However, in order to achieve such goals, it will be necessary for Japan to solve numerous problems.

One is to establish an independently developed technology. In the case of "Himawari 2," which is said to be the first working satellite launched into stationary orbit independently by Japan, the ratio of domestic production of the N-II rocket used for the launch was 49 percent and that of the satellite itself 28 percent. In fact, more than half of it was dependent on foreign countries.

Certainly, the percentage of domestic production is increasing year by year. When we considered that the "Himawari" launched by the United States in 1977 was only 11 percent domestically produced, it is safe to say that the ratio in "Himawari 2" was much better. Since the relay transmitter and antenna of the number two

communications satellite to be launched next year will be supplied from domestic production, the overall ratio of domestic production will be 65 percent, well over half, considering only the launch rockets, the ratio of domestic production of the next generation H-1 rocket will reach 85 percent in one jump.

However, the difference in quality compared to European and American technology is still large, as shown by a survey of the current situation prepared in the autumn of last year by the Federation of Japanese Machinery Manufacturers. It says, "In the field of space industry, such as satellites and rockets, items of imported technology number 57, those of exported technology only one."

A good example of this is that of the apogee motors which are the essential power source for putting satellites into stationary orbits. Japan at present relies 100 percent on American products for these apogee motors, so when we speak of independently launched stationary satellites we are ignoring the part that gives life to the whole. Moreover, the apogee motors imported from the United States to Japan are made as "black boxes" and cannot, naturally, be disassembled, nor can we obtain their plans, so Japanese technicians must grapple with the development of apogee motors literally blindly. If the space industry is to grow in the future, it is well expected that a move may be stirred up in the United States to not only designate certain components as "black box" items but also to stop supplying these components to Japan altogether in fear of Japan's ability to absorb technology. If Japan does not establish an independently developed technology, the space industry will be considerably retarded. And, since there are space industry spins-off to other industries, it follows that delays in the space industry will affect other fields as well.

Next, in aiming at the establishment of such an independent technology, it goes without saying that a large amount of development capital is required. However, at present, Japan's space industry is largely dependent on the sponsorship of government and public agencies. Of the space industry which is described as being worth 100 billion yen, the satellite made up 15 million yen and the rocket 38.2 billion yen (1979) the scope of the market was small and the makers of the satellite expressed dissatisfaction that "the amount of work is too small." Subsequently, they urged an increase in the budget for space development, saying, "There is no other way for satellite manufacturers to become established than through the efficiency of quantity production."

However, when we look at the 1981 budget, it shows 99 billion yen for the National Space Development Agency and 11.2 billion yen in development capital for the satellites and rockets of the Institute of Space Science (formerly the Tokyo University Institute of Space and Aeronautical Science). Moreover, a stringent financial restructuring is being urged, and it seems that the 1982 budget will be a step sideways, at best.

Since the United States' space development budget, when Defense Department related items are included, is 2.6 trillion yen, funds 26 times the Japanese budget are being poured into the space industry. The ESA [European Space Agency] budget, too, is about 3.5 times that of Japan. This being the case, the dissatisfaction coming from Japanese manufacturers is most understandable. Hereafter, it will be essential to increase private demand, including overseas exports.

Consdierable Spin-offs from Space Industry

Recently the Japan Aeronautical and Space Manufacturers Association carried out "A Survey of Space-Related Industry in Japan in 1979," directed to space related manufacturers.

According to this, of 83 companies responding, 70 replied that they had accepted space-related orders. Looking at these by type of industry, there were five chemical industry companies, including Nippon Oils and Fats (mostly rocket fuels), 32 manufacturers of electrical machinery and devices, including Oki Electric Industry and Toshiba (devices aboard rockets and artificial satellites), three general machinery manufacturers, including Mitsubishi Heavy Industries (rocket construction), three manufacturers of transportation machinery, including Nissan Motor (rocket construction), seven makers of precision instruments, including Shimayzu Seisakusho (instruments used aboard and in ground installations), one rubber products manufactuerer, Yokohama Rubber (rocket parts) and wholesalers and construction companies. The breadth of the space industry was evident.

The sales value of these 70 companies was 103.2 billion yen. Since sales in 1978 were 105.4 billion yen, sales remained sluggish at over 100 billion yen for 2 years running.

Looking at the breakdown of sales, rockets were the largest item at 34 billion yen, next came ground installations at 32.8 billion yen, while artificial satellites amounted to 16 billion yen. Of this, 22.1 billion yen, or 21.4 percent were exports, the greater part being ground installations, including data retrieval and processing instruments. These ground installations are a Japanese strong point of the space industry, and for the future, too, this area has bright prospects. However, imports were 25.3 billion yen, greater than exports.

Additionally, there were about 4,700 persons employed in the space industry. Comparing this number of workers to those in Europe and the United States in the same year, the United States had 99,000 including the missile field, and Britain, France and West Germany, taken together, had 12,500. It is clear that in terms of human involvement too, the scale of the space industry is still rather small.

A Rough Road for Japanese Space Industry

Considering the subject in this way and in view of the findings in the report of the Round Table Conference on the Fundamental Problems of the Space Industry of Japan the establishment of a firm foundation for the space industry within 10 years seems considerably difficult.

However, within MITI it is felt that we can catch up with those countries that are advanced in space within 10 years, and that the Japanese space industry will be independent by about 1990. The reason for this is that in ground installations and the area in relation to satellites where electronics and precision manufacturing technology combine, Japan will be able to catch up with other countries. Thus, taking this round table conference report into consideration MITI intends to develop the space industry enthusiastically.

First is the planning of "space factory systems." As already mentioned, because weightlessness exists in space, it is possible to make materials unobtainable on earth, such as ideal alloys and high purity crystals. Here, the meaning of "space factory systems" is the establishment of manufacturing techniques for factories in space and, at the same time, the research and development of production machinery for factories in space. Naturally, it goes without saying that this will be based on the Japanese space shuttle, a "small, winged, recoverable craft" of whose research and development have been pushed since 1978. The United States, as a matter of course, and several nations of Europe are enthusiastic about the space factory project. The space lab to be carried aboard the American space shuttle will be developed by the ESA.

MITI hopes to start this project in 1982 as an 8-year plan. The budget is anticipated to be on the level of 50 billion yen, which will certainly give a new complexion to Japan's space industry.

However, ideas aside, it seems that such a scale of budgeting is too small. Since it is an 8-year plan, this project will be completed in 1990 precisely. This year is also the year in which MITI expects Japan to catch up with the United States and Europe in space industry, but this really assumes that European and American space development will halt at their present points, whereas, as related previously, when budgets for space development are compared, those of Europe and the United States are incomparably greater than that of Japan. Therefore the catching up is not only very difficult, but it may very well be that their superiority will be much greater in the future.

The above-mentioned report emphasized the necessity of developing private demand, including overseas exports, for the Japanese space industry, which is presently strongly dependent on the sponsorship of government and public agencies and which is naturally limited by their budgets. Certainly this may be one way out, but in practice it seems rather difficult.

Furthermore, the establishment of an independently developed technology is urgent to place the space industry on a solid footing. However, since this, too, requires large amounts of research and development capital, it seems highly dubious to think of the space industry as comparable to household appliances or automobiles. Rather it is better to consider it in terms of cooperative international development.

Whichever way one looks at it, the prospects for the Japanese space industry to realize the vision given in that report are not too bright.

9898
CSO: 4106/20

SCIENCE AND TECHNOLOGY

AUTO, AUTO PARTS, SEMICONDUCTOR MAKERS VIE IN MINICAR WAR

Tokyo CHUO KORON KEIEI MONDAI in Japanese Winter 1981 pp 134-145

[Article by Yukio Suzuki of the Nomura Research Institute of Technology and Economics]

[Excerpt] Improvement of Engine Performance

Only 20 percent of the fuel energy in a gasoline engine is actually used for propulsion. There is accordingly a great deal of research aimed at improvement of fuel efficiency of engines. Interest is centered on the use of car electronics, diesel fuel and turbochargers; the sale of automobiles equipped with such features has begun.

Electronification of automobiles is a broad field which includes such things as: 1) engine control systems aimed at fuel economy and pollution control, 2) gauge display systems, 3) safety systems such as antiskid devices, and 4) systems related to comfort and drivability, such as air conditioning and cruise control. In particular, full-scale efforts are under way to develop engine control systems using microcomputers.

General Motors equipped some of its 1977 models with a "miser" system, and Ford began to sell electronic engine control (EEC) systems in its 1978 models; both were designed for control of engine ignition timing. In Japan, Nissan Motors developed an engine central control system (ECCS) using a Hitachi 8-bit microcomputer; this was adopted for mass-production models. In addition to controlling ignition timing, it provided the world's first microcomputer control of fuel injection and improved fuel economy by about 10 percent. After that Mitsubishi Motors, with the cooperation of Mitsubishi Electric Corp and Mikuni Kogyo Co, developed the ECI engine control system. In 1980 Toyota Motors equipped its Mark II with the TCCS control system, which uses a Toshiba Corp 12-bit microcomputer.

This progress in electronification of cars is expected to be accompanied by a great expansion in demand for related products. The companies involved are making active efforts to meet this demand. Nippon Denso Co, a member of the Toyota group and a world leader among automotive parts manufacturers, has put full effort into research in this field since about 1970; it began inhouse production of integrated circuits (IC) in the fall of 1976. Technical innovation is rapid in

the field of electronics; planning and the development and accumulation of production technology are indispensable. Nippon Denso has turned its hand to both, and by leading the industry, it is building a base for growth in the field of car electronics.

Development will require full cooperation among the automobile manufacturers, auto parts manufacturers and major semiconductor manufacturers. There is, however, fierce competition among the three. As seen in the case of Nippon Denso, it is important to cover replacement of existing mechanical parts and to maintain internal production of high-added-value parts required by improved functions by keeping a firm hold on production technology and sofeware related to basic design. On the other hand, a large new automobile market is unfolding for major semiconductor manufacturers, and there will be great opportunities for profit if they enter that market quickly. Automobile manufacturers can also make full use of the IC technology at which Japan excels; this will have great significance in terms of the minicar competition with Europe and the United States.

Conversion to diesel engines has progressed rapidly. The history of diesel passenger cars in Japan goes back to before 1965, when full-scale motorization began. But it is only in the past few years that the economics of diesel passenger cars has been reconsidered. Because of good fuel efficiency at high compressions and the low cost of diesel oil, the fuel economy is more than twice that of gasoline-powered cars.

Diesel engines are gradually being made smaller, and there is hope for the appearance of minicars suited to the class of users who demand truly economical automobiles. As part of its moves toward diversification of products, West Germany's Volkswagen (VW) announced its epochal Golf diesel (1500 cc) in 1975; this enabled rebuilding of the business. In Japan, in the fall of 1979 Isuzu Motors Ltd announced the Gemini diesel (1800 cc), which was highly rated and was in no way inferior to the VW engine performance. Isuzu Motors, which is a member of the GM group, made dieselization a mainstay of its product strategy. The demand is increasing rapidly.

With advances in the use of diesel engines, Diesel Kiki Co, a producer of diesel fuel injection pumps (accounts for 70 percent of domestic production), decided to introduce technology from Robert Bosch, a West German company which is the world's largest, and began production of high-performance injection pumps for small cars. The very same move was made by Nippon Denso, which ranks number two in this industry. For these companies, the growth potential of new injection pumps is quite large. But in the case of diesel passenger cars, there is a good chance that emission control regulations will be strengthened at home and abroad. In order to meet emission control requirements while maintaining the economic superiority of diesel vehicles, the manufacturers involved are making every effort to develop technology, including microcomputer control of diesel engines.

There is activity in regard to adoption of turbochargers to reuse the energy in automobile exhaust gases and increase the power. Turbochargers were first used in Japan in Nissan's Cedric at the end of 1979. Nissan has increased the number of models with turbochargers, and Mitsubishi Motors has begun to sell diesel turbos. Toyota Motors recently announced the Crown Turbo. Both Nissan and Toyota import

their turbochargers from America's Garret Co (Air Research Division). In the case of the Toyota Crown, the retail price of the turbocharger car is 150,000 yen higher than others of the same class, but the fuel efficiency is 9 to 14 percent better. This cannot be called a complete success in terms of economy, but much is expected of research to apply turbochargers to the minicar class. Moreover, in terms of marketability strategy, the turbocharger serves as an "image leader" because of its good performance at high speeds.

Promotion of Smaller, Lighter Cars

Improving engine performance is one way to improve fuel consumption; another is development of smaller and lighter cars.

It is said that cutting the current weight of cars by 10 percent would improve fuel efficiency by 8 percent. But it is impossible to meet the needs of diverse users by simply reducing the size of the automobiles. Thus preservation of space utility, by making the body smaller and lighter while keeping the passenger compartment as roomy as possible, has become a fundamental of product development. The GM Citation (an X-car), which went on sale in the spring of 1980 and has sold well, is 340 kg lighter and about 50 cm shorter than the old Nova, but there is slightly more interior space and the fuel efficiency is some 30 percent better.

In line with that thinking, there has been a great increase in FF (front-wheel drive) cars lately. Four or 5 years ago FF cars made up 15 percent of the passenger cars produced in Japan, but this year they will make up nearly 30 percent. The figure is expected to approach the 60 percent level among European cars. In the spring of 1981 Toyo Kogyo switched to front-wheel drive for its new Familia (1300 cc); it is 25 kg (about 3 percent lighter than the old model) and front-wheel drive contributed 80 percent of the reduction.

FF cars differ from the standard rear-wheel (FR) drive in that a long drive shaft is not required. On the other hand, the transmission is replaced by the transaxle, and even with a larger oblique angle for the front axle, a synchronous ball joint which maintains a uniform rate of rotation is necessary as a major component. Each of the automobile manufacturers has begun large-scale investment in facilities to convert from transmissions to transaxles. Honda Motor Co and Fuji Heavy Industry are in an advantageous position in terms of investment because their small passenger cars have all been FF cars for some time.

In the 1960's NTN Toyo Bearing Co formed a technical linkup with Britain's GKN group, and it now monopolizes the supply of synchronous ball joints to domestic manufacturers. The increased demand for synchronous joints accompanying the shift to front-wheel drive will be a strong growth factor for this company. Toyota and Nissan, on the other hand, have gotten the technology from GKN to begin their own production of synchronous joints. Honda has succeeded in developing its own synchronous joints without using the technology of GKN, which has become the world standard; more weight is being given to internal production of this item.

Another factor to be noted in regard to smaller and lighter cars is the conservation of materials and use of alternative materials.

The raw materials used to produce an automobile are, for a car weighing 1 ton, 780 kg of steel (including specialty steels), 60 kg of aluminum and other nonferrous metals, and 160 kg of nonmetallic materials such as plastics, rubber and glass. The proportions of nonferrous and nonmetallic materials have increased from those of 3 years ago, and this trend will continue. Less material is used because of design changes such as reducing the thickness of engine walls, and larger quantities of new and lighter materials are being used; this is an active effort to improve fuel consumption.

The weight of steel materials used can be reduced sharply by using sheets of high tensile strength steel, which can be made about 10 percent lighter than ordinary steel sheets.

Although high tensile strength steel sheets are stronger than ordinary steel sheets, they are also harder to work with and their use is limited. But recently steel makers have succeeded in producing cold-rolled steel alloys which have twice the standard ductility and thus have superior processing characteristics. Of the latest models, the Nissan Leopard uses 70 kg of high tensile strength steel and the Toyota Mark II uses 57 kg; it is expected that with each model change more cars will use it for lightness. Moreover, Japanese steel makers, which are in the top class worldwide, are developing new, high-value-added tactics in order to lead the world in terms of product development as well as competitive technical costs.

Among the nonmetallic materials, there will be increased use of plastics.

At present about 50 kg of plastics are used in each passenger car. But through the end of the 1980's there is expected to be a steady increase in the use of fiber reinforced plastics (FRP), composites using carbon fibers, and high-performance polymers called engineering plastics.

Carbon fiber reinforced plastics (CFRP), for example, are characterized as being "stronger than steel and lighter than aluminum," but the present cost is over 10 million yen per ton. At this level, CFRP cannot be adopted by the automobile industry, which has stringent cost constraints.

Toray Industries Inc, which produces 50 percent of the world's CFRP, has done research in this field since the mid-1960's. This research has been fruitful: there has been a sharp rise in demand for use in aircraft, and Toray is in a position to export technology to America's UCC. There are active efforts to develop uses in automotive parts, and new developments can be expected when quality and performance technology is built up and the cost is reduced through mass production.

Improved Productivity

The major issue is how to quickly put new products that meet the user's needs on the market and at the same time build efficient cars.

Here is a comparison of the labor productivity of Toyota, Nissan, GM and Ford.

Based on 1979 figures, there is a great discrepancy in the numbers of cars produced per worker per year, with 71 for Toyota, 46 for Nissan, 11 for GM and 12 for Ford. If annual productivity is compared on a value-added basis there is still a gap: $53,000 for Toyota, $39,000 for Nissan, $33,000 for GM and $27,000 for Ford. However, a simple comparison cannot be made because: 1) the U.S. companies produce their own parts and have a higher rate of internal production, and 2) Toyota differs from Nissan in having a separate sales company (Toyota Motor Sales Co).

Even though a strict comparison cannot be made, the important point is that in terms of the number of vehicles, the productivity of U.S. manufacturers has not increased at all (see Figure 2). According to a study by the ITC (U.S. International Trade Commission), the productivity of the U.S. automobile industry remained unchanged from 1975 to 1979, at a level of about seven cars per thousand manhours. Wages increased 9.4 percent per year during this period, more than could be covered by price increases. The same study found that the average hourly wage in the U.S. automobile industry was over $16/hr in the first half of 1980; this is 30 percent higher than the average for U.S. manufacturing industries and 50 percent higher than Japanese wages.

One more point is the difference in labor-capital ratios (acquisition basis)--the amount of equipment per employee. Using the previous basis for comparison, there is a large gap: $115,000 for Toyota, $82,000 for Nissan, $29,000 for GM and $29,000 for Ford. Again, it is not possible to make a simple comparison because of different ratios of overseas production and production by subcontractors. For all four companies there was steady growth (on a nominal basis) in the labor-capital ratio during this 5-year period: 50 percent for Toyota and Nissan, 30 percent for GM and 40 percent for Ford.

In 1977, U.S. manufacturers began to greatly increase investment in facilities. They plan to invest $80 billion in the 6 years from 1980 through 1985; the average annual investment of $130 billion is more than double that of the past 5 years. If overseas investment is excluded, the 10 major Japanese automobile manufacturers will also nearly double their investment.

As for a breakdown of facilities investment, the greatest emphasis has been put on new products aimed at the need to conserve energy, but greater effort has also begun to be put into making the production system more efficient. The basic goal is to move ahead with a flexible manufacturing system (FMS) which is automatically adjusted to production of different models. FMS actively involves highly flexible technology so as to achieve high production efficiency while quickly responding to model changes and changes in demand.

Because of this, there are prospects for a major advance in the introduction of NC (numerically controlled) machine tools and industrial robots. Orders from automotive manufacturers to Japan's machine tool industry have increased sharply. Orders received in 1980 were up 50 percent from the previous year, and the 1981 workload has been assured all through this year. Accordingly, dependence on automobiles for domestic orders will rise from the 30 percent of the past to 40 percent next year. The proportion of NC tools within the total production of machine tools in

1979 was 42 percent, double the figure for 1976. As FMS progresses, there may well be a sharp rise in the use of numerical control for single-purpose machine tools.

Industrial robots have also begun a period of growth. Rather than automation of single-purpose facilities, there is a generalization of automated machinery with a diversity of computer controlled functions. This will bring a reduction in labor costs and improvement of working conditions. High-performance machinery to meet such needs is being developed. Robots will be adopted in large numbers for body welding and painting processes.

With progress in technological development, the use of robots is expected to extend to appropriate parts of the assembly process. The adoption of new materials and changes in production methods to make lighter cars will increase demand for die-casting and injection molding equipment.

An increase in exports is also expected. For the tool manufacturers which support Japan's superior minicar production technology, there is much room to develop demand in the European and U.S. industries, which are undergoing a facilities investment boom. Thus, the various machine tool manufacturers involved can be expected not only to contribute to the strengthening of the Japanese automobile industry's ability to compete internationally, but also to be active in the world market.

Moving Into the Overseas Market

Trade friction among automobile producing countries has taken on a complicated aspect as minicar competition between Japan, the United States and Europe has intensified. The automotive industry is a strategic industry which occupies an important position within the national structure of major countries like Japan, the United States, West Germany, France, Britain, Italy and Canada. Automobiles made up the following percentages of total national exports in 1977: 18 percent for Japan, 10 percent for the United States, 14 percent for West Germany, 12 percent for France, 7 percent for Britain, 8 percent for Italy and 21 percent for Canada. In all seven countries, automobiles have the top export volume within the machine industry.

The issue of U.S. import restrictions is coming to a climax, and trade friction with Europe is also becoming increasingly severe.

According to a survey by EUROFINANCE, the European automobile market at 10 billion vehicles per year is about the same size as the U.S. market, and in 1983 the balance between imports and exports is expected to turn to an import surplus, in terms of number of vehicles.

And so even though competition among Japanese, U.S. and European automobile manufacturers is becoming more intense, the winning and losing companies will no longer be decided just on the basis of former conditions of competition. As a result, the major Japanese automobile manufacturers face the necessity of bringing into their company strategies in response to the difficult task of "seeking the path of coexistence while maintaining competitive relations." In this

instance, provision of technology and capital in the broad sense will be fundamental. It will be important to foster international cooperation while joining together capital and technology through technical agreements, licensed production or through local production using joint ventures, capital participation or 100 percent direct investment.

Moves in this direction have already begun. Examples include: 1) Honda's plan to produce passenger cars in the United States and the licensed production with Britain's BL; 2) Nissan's production of minitrucks in the United States, its capital participation in Motor Iberica (Spain) and its passenger car joint venture with Alfa Romea (Italy); and 3) the idea of joint passenger car production by Toyota and Ford.

While Japanese automobile manufacturers are expanding procurement of parts from overseas, foreign manufacturers have also moved to enhance their own competitive positions by making use of companies in Japan's automotive industry. GM, Ford and Chrysler have invested in Japanese partners (GM owns 34.2 percent of Isuzu Motors, Ford owns 25 percent of Toyo Kogyo and Chrysler owns 15 percent of Mitsubishi Motors), and are trying to purchase major parts for minicars. Isuzu Motors provides GM with minicar diesel engines and manual transaxles (MTX) for FF cars. Toyo Kogyo exports MTX for Ford's FF minicar (Erica), and is also to begin providing automatic transacles (ATX) and diesel engines. This year Mitsubishi began exporting engines for Chrysler's FF minicar (K-car). Of course, this will expand the demand of these three companies with respect to companies which manufacture automotive parts.

There has been an increase in cases of parts manufacturers themselves exporting directly to automobile manufacturers. Worldwide passenger car production is in excess of 30 million cars per year, so if there is a shift to minicars, there is potential for expansion of the market for Japanese automotive parts. U.S. manufacturers are actively engaged in international parts procurement with an emphasis on quality and performance, and there are many deals with Japanese parts manufacturers.

Japanese companies are eagerly exporting parts which can be used in their own product lines with existing technology, but there are many parts manufacturers which are wary of exporting new products developed jointly with automobile manufacturers.

As seen by parts manufacturers, the overseas market falls into three categories. Illustrating with the U.S. market, there are: 1) the large after-sales market for Japanese cars, with ownership expected to pass the 9 million level, 2) the new market for parts supplied to U.S. manufacturers which are switching to minicars, and 3) the parts market for Japanese cars built in the United States, if Japanese manufacturers do decide on local production. If a certain level of demand in these markets can be guaranteed, it will be quite possible to advance into them. For example, the U.S. plant of Nippon Oil Seal Industry Co is aimed at U.S. automobile manufacturers, and NGK Spark Plug Co is looking at the after-sales market for spark plugs.

Within the Nissan group there are plans to build up Mexican operations by sending in such subsidiaries as Nippon Radiator, Atsugi Automotive Parts and Kinugawa Rubber Industry Co. There are also parts manufacturers such as Akebono Brake Industries which hope to play roles as partners with U.S. parts manufacturers rather than sending in wholly owned subsidiaries and which are considering entering the U.S. market through joint ventures or licensed production.

Thus the overseas strategies of parts manufacturers are taking a variety of forms, but they are becoming more concrete.

New Long-Term Strategy Necessary

It is said that a period of 4 years is required to develop a new car. Recent improvements in computer-assisted design (CAD) technology may allow the development period to be shortened somewhat. But if 4 years is taken to be the model cycle in principle, it will be some time yet before models using the technology being developed now will appear on the market. All-out competition with U.S. minicars will reach a climax in the middle of this decade when the new models are lined up.

West Germany's Volkswagen (VW) has unveiled the concept of a VW 2000 passenger car in the 1990's. It cannot be called a complete departure from the Golf, VW's leading model at present, but the company is pursuing long-term research and development with a clear objective. Moreover, a distinction is made between research and development, with the development division responsible for cars to be produced in the 1980's and the research division handling car concepts for the 1990's. This point is not limited just to VW; it is seen in automobile manufacturers throughout the world.

If peripheral industries are to find new market opportunities in the automobile industry, it is important that they become involved in the early stages of research and development and develop needs into actual products. The research and development system of automobile manufacturers has gone full cycle and now depends to a great extent on the development abilities of related companies which have superior technology. As seen in the examples of car electronics and new materials, it is necessary to synthesize from basic technology. Representative Japanese companies with the ability to synthesize should be able to take a greater part in the development of new fields in the automobile industry. Microcomputers, high tensile strength steel sheets, NC machine tools and industrial robots all show that improved technology in related fields works to strengthen the ability of Japanese automobile manufacturers to compete.

On the other hand, the present automotive parts manufacturers will have to try to escape from the "number of vehicles slide." That is, parts manufacturers have poor prospects for growth if they are completely dependent on automobile manufacturers in the sense that their own sales can slide up only with increases in the number of automobiles produced. Even if the competitive strength of the Japanese automobile industry, which is forced to maintain a competitive interdependence, is further demonstrated, it will be almost impossible to bring about the steady high export growth seen in the 1970's. It will thus be necessary to further

rationalize in order to enhance the competitive position of the group and to aim for profit and growth supported by independent product development.

The course will differ from one automotive parts manufacturer to the next. The courses can be roughly categorized into two groups: 1) improvement of product performance and development of new parts within the automobile industry, with its 1.6-trillion-yen scale of production; and 2) diversification away from the field of automobiles, using the production and development technology fostered within the automobile industry. Few companies have taken the second course in the past; the reason has been the high growth rate of automobiles. The key will be the possibility of developing overseas markets and opening up new automotive fields as fuel-efficient cars are developed. It is important for automotive parts manufacturers, which are highly group-oriented, to upgrade their status within the group while developing markets outside it. In fact, such moves can be seen very clearly in companies such as Nippon Denso.

The worldwide automotive industry faces a period of change. Related industries have also entered an era of opportunity for growth and of severe trial. It is hoped that steady implementation of new long-term strategies will make a success of the 1980's.

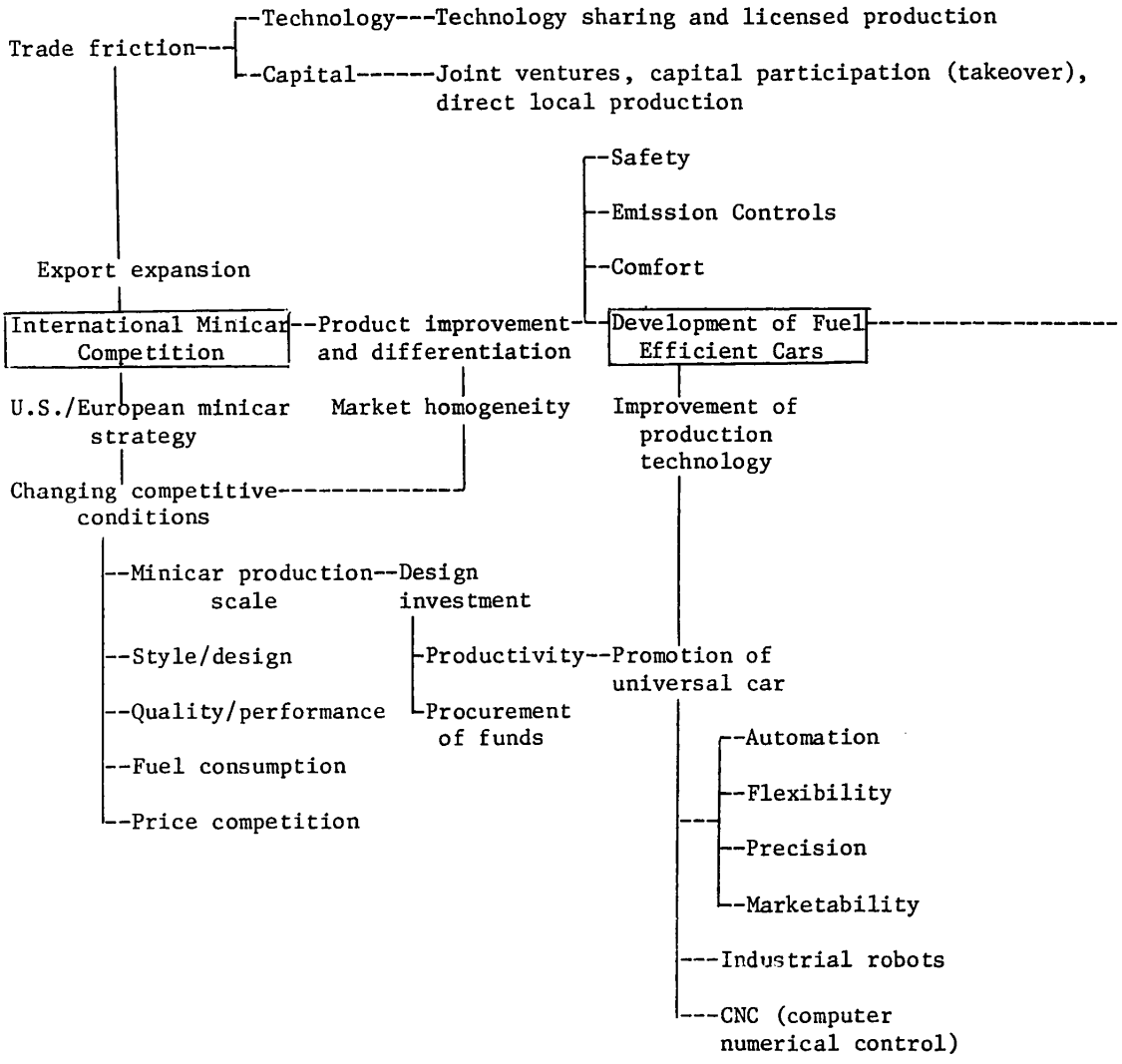
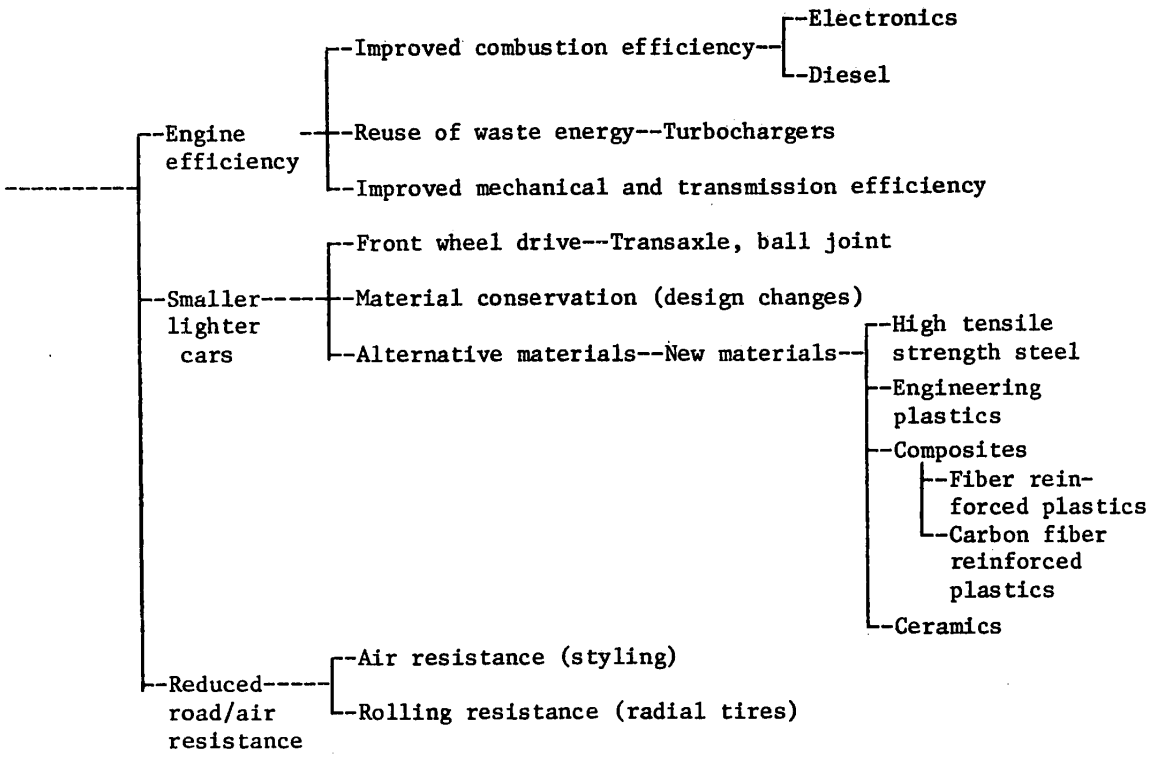


Fig. 1. Framework of International Minicar Competition



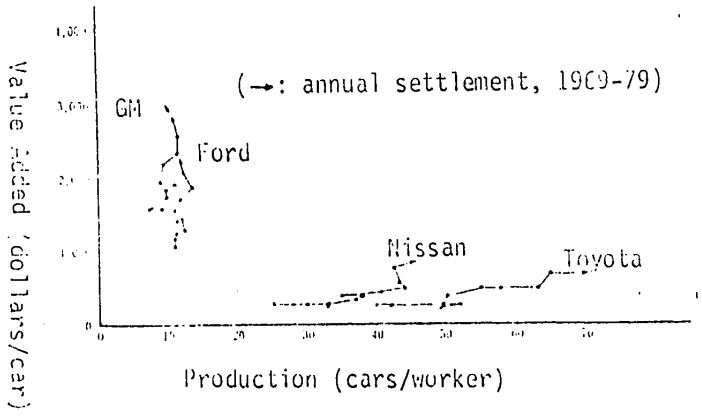


Fig. 2. Productivity of Major Japanese and U.S. Automobile Manufacturers

Labor productivity = $\frac{\text{Total added value}}{\text{Vehicles produced}} \times \frac{\text{Vehicles produced}}{\text{Workers}}$ = Added value per vehicle x vehicles produced per worker

9601
CSO: 8129/0418

SCIENCE AND TECHNOLOGY

THEMES, ENTERPRISES SELECTED FOR 10-YEAR TECHNOLOGY PROJECT

Tokyo DENKI SHIMBUN in Japanese 10 Sep 81 p 5

[Text] MITI Unofficially Decides on Enterprises To Develop Next Generation Basic Industrial Technologies; 10-Year Contracts To Be Signed in Early October

On the 11th, MITI will convene a meeting of the Industrial Technology Council's Next Generation Industrial Technology Development Department (chairman, Isamu Yamashita, vice chairman of the Federation of Economic Organizations), and determine the plans to carry out the Next Generation Basic Industrial Technology Research and Development System, which will begin during the present fiscal year. Prior to this, however, it has unofficially decided on the enterprises which will be commissioned to work on the R & D for this project. It had previously announced the recruitment of enterprises, and it recently concluded the evaluation and selection of the principal enterprises based on three developmental areas: new materials, biotechnology, and new function elements. The contracts will be signed as early as the beginning of October. Already the enterprises have established associations or foundations in order to carry out their research smoothly. For the next 10 years the enterprises will be involved in the development of basic technologies essential for advanced industries, while maintaining close contact with national research agencies.

Three Areas of New Materials, Biotechnology and New Function Elements

MITI's Next Generation Basic Industrial Technology R & D System established this fiscal year is part of its overall efforts to renovate technologies through Japan's independent technologies, something which it had previously neglected. MITI's aim is to waste no time in carrying out R & D on advanced basic technologies essential for the establishment of next generation advanced industries, in particular, the space, nuclear power, marine, new energy and biochemical industries, i.e., those whose full development is expected in the 1990's.

Originally, MITI selected a total of 16 themes in the three areas--new materials, biotechnology, and new function elements--as basic technologies common to the next generation industries, and planned to budget about 120 billion yen for 10 years of R & D. However, because at the time when this fiscal year's budget was being set up the Ministry of Finance disclosed a severe assessment policy due to financial difficulties, the budget for the first year of the project was cut down to about 2.7 billion yen (requested amount, 5.2 billion yen) and the number of themes was also reduced to 12.

Because of this, the technologies applicable to the present system are: six themes in the area of new materials: 1) fine ceramics, 2) highly efficient separation membrane, 3) conducting high particles, 4) high crystal high particles, 5) high performance crystal control alloy, and 6) compound materials; three themes in the area of biotechnology: 1) application of volume cell culture technology. 2) application of gene splicing technology, and 3) application of bioreactor technology in engineering; and three themes in the area of new function elements: 1) super lattice electronic elements, 2) three dimensional electronic elements, 3) environmental hazard resistant devices.

In line with these 12 themes, MITI has established a "Next Generation Department" within the Industrial Technology Council so as to consolidate the promotion structure nationally, and in order to promote participation of the private sector it has consolidated the preparations to consign research work to private enterprises. Recently it announced recruitment of the consignees.

On the 9th, as a result of its evaluation of the applicants, MITI unofficially decided on the enterprises shown in the table below. As soon as MITI made its announcement, these enterprises began establishing associations and foundations to handle the consigned projects; it will be these organizations that will in fact promote the research activities.

The newly established organizations are: a High Particle Basic Technology Research Association, a Fine Ceramics Technology Research Association, and a Next Generation Compound Materials R & D Association (foundation), all in the area of new materials; a Biotechnology R & D Association in the field of biotechnology; and (foundation); and a New Function Element R & D Association, in the area of new function elements.

The contracts with the enterprises are expected to be concluded by early October, at which time a 10-year research on basic technologies aiming at the 1990's will begin in conjunction with the national research agencies. Since the development themes are focused on 12 topics for the time being, the consigned amount is expected to total about 80 billion yen. A meeting of the Industrial Technology Council's Next Generation Department will be held on the 11th, at which time actual plans are expected to be revealed.

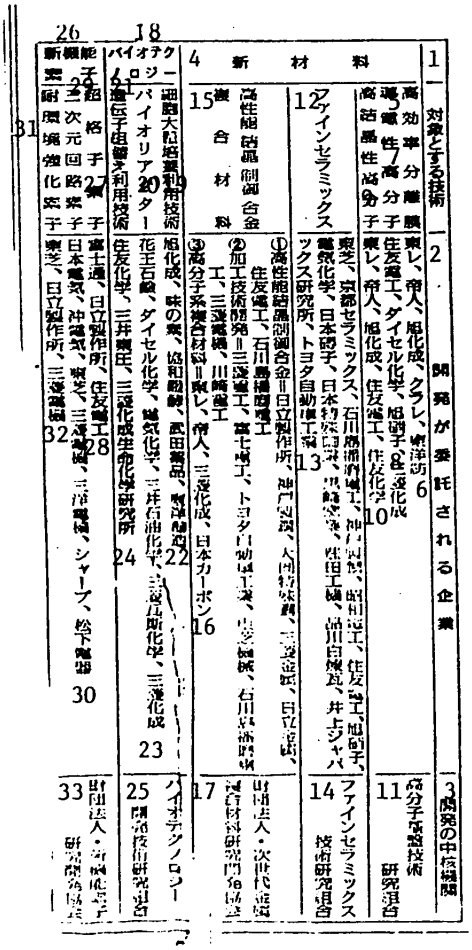


Table. Technological Themes, Enterprises, and Major Organizations Commissioned Under the Next Generation Basic Industrial Technology Research & Development System.

1. Technologies
2. Enterprises commissioned
3. Major organizations responsible for development
4. New materials
5. Highly efficient separation membrane
6. Toray, Teijin, Asahi Chemical, Kuraray, Toyobo

7. Conducting high particles

8. Sumitomo Electric, Daisel Chemical, Asahi Glass, Mitsubishi Chemical

9. High crystal high particles

10. Toray, Teijin, Asahi Chemical, Sumitomo Electric, Sumitomo Chemical

11. High Particle Basic Technology Research Association

12. Fine ceramics

13. Toshiba, Kyoto Ceramics, Ishikawajima-Harima Heavy Industries, Kobe Steel, Showa Denko, Sumitomo Electric, Asahi Glass, Denki Kagaku, NGK Insulators, NGK Spark Plug, Kurosaki Refractories, Toyoda Machine Works, Shinagawa Refractories, Inoue Japacs Research Institute, Toyota Motor

14. Fine Ceramics Technology Research Association

15. High performance crystal control alloy

Compound materials

16. 1) High performance crystal control alloy--Hitachi, Kobe Steel, Daido Steel, Mitsubishi Metal, Hitachi Metals, Sumitomo Electric, Ishikawajima-Harima

2) Processing technology development--Mitsubishi Heavy Industries, Fuji Heavy Industries, Toyota Motor, Toshiba Machine, Ishikawajima-Harima, Mitsubishi Electric, Kawasaki Heavy Industries

3) High particle related compound materials--Toray, Teijin, Mitsubishi Chemical Industries, Nippon Carbon

17. Foundation, the Next Generation Compound Metal Materials R & D Association

18. Biotechnology

19. Large volume cell culture technology

20. Bioreactor

21. Gene splicing technology

22. Asahi Chemical, Ajinomoto, Kyowa Hakko Kogyo, Takeda Chemical Industries, Toyo Jozo

23. Kao Soap, Daisel Chemical, Denki Kagaku, Mitusi Petrochemical, Mitsubishi Gas Chemical, Mitsubishi Chemical

24. Sumitomo Chemical, Mitsui Toatsu, Mitsubishi Chemical Life Science Research Institute

25. Biotechnology Developmental Technology Research Association

26. New function elements

27. Super grid elements

28. Fujitsu, Hitachi, Sumitomo Electric

29. Three-dimension circuit elements

30. Nippon Electric, Oki Electric, Toshiba, Mitsubishi Electric, Sanyo Electric, Sharp, Matsushita Electric

31. Anti-environment reinforcing elements

32. Toshiba, Hitachi, Mitsubishi Electric

33. Foundation, New Function Elements Research and Developmental Association

9711
CSO: 4106/1

END